Trade in services and trade in goods: differences and complementarities

Carolina Lennon

PARIS SCHOOL OF ECONOMICS
ÉCOLE D'ÉCONOMIE DE PARIS

WORKING PAPER N° 2008 - 52

Trade in services and trade in goods:

Differences and complementarities

Carolina Lennon

JEL Codes: F12, F15, L8

Keywords: International trade in services, trade in goods, gravity equations

PARIS-JOURDAN SCIENCES ECONOMIQUES
LABORATOIRE D'ECONOMIE APPLIQUÉE - INRA

48, BD JOURDAN – E.N.S. – 75014 PARIS
TÉL. : 33(0) 1 43 13 63 00 – FAX : 33 (0) 1 43 13 63 10
www.pse.ens.fr

CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE – ÉCOLE DES HAUTES ÉTUDES EN SCIENCES SOCIALES
ÉCOLE NATIONALE DES PONTS ET CHAUSSÉES – ÉCOLE NORMALE SUPÉRIEURE

Trade in Services and Trade in Goods: Differences and Complementarities

Carolina Lennon[1]

Preliminary Version . Please do not cite or quote without permission. Comments are very welcome.

First Version: August 31, 2006

Abstract

Despite the increasing importance of services in national economies (accounting for about 50-70 % of internal product), in global economy (accounting for the 20 % of global trade) and in public opinion (i.e. US Concern about Mexican workers due to migration laws or the case of the "polish plumbers" in France at the time of European Constitution referendum) there is no economic consensus about the way in what services should be considered in trade liberalization analyses. The double purpose of this paper is; first, to empirically determine to what extent trade in services differs from trade in goods and, second, to explore for potential complementarities between bilateral trade in goods and bilateral trade in services. For our first goal we regress a set of equations derived from the gravitational model and for the second we instrument bilateral trade for both services and goods in order to analyse potential causalities of each type of flow in the other. Main results show that "bilateral trust and contract enforcement environment", "networks", "labor markets" and "technology and technology of communication" have higher impact on service trade than on trade in goods; finally, after instrumenting for endogeneity, we found that bilateral trade in goods explains bilateral trade in services: the resulting estimated elasticity is close to 1. Reciprocally, though in a lower extent, bilateral trade in services affects positively bilateral trade in goods: a 10% increase in trade in services raises traded goods by 4.6%.

[1] University of Paris 1 (Panthéon-Sorbonne, CES) and Paris-Jourdan Sciences Economiques (PSE), 48 bd Jourdan, 75014, Paris, France. E-mail: carolina.lennon-zaninovic@malix.univ-paris1.fr

Acknowledgements: I thank Miren Lafourcade, Thierry Mayer, Daniel Mirza, Also I am especially grateful to participants at the European Trade Study Group Conference, September 2006, Vienna. and to participants at the Working in Progresse Seminar at PSE, Paris, France.

1. Introduction

The services sector is the biggest contributor to a country's economy, its contribution increases with the level of development of countries, ranging from 47 percent of countries' GDP in the case of low income countries to a contribution of 70 percent in the case of high income countries (See Figure 1).In addition, measured by the balance of payments (BOP), over the past two decades, growth of trade in services has surpassed growth of trade in goods. Trade in goods has multiplied by 3,5 while Total services has multiplied by around 5. (See Figure 2).The growing importance of services in domestic economies and international trade is largely due to an increase in the production of intermediate services (i.e. outsourcing). Firms increasingly delegate costly knowledge-intensive intermediate-stage processing activities to specialized suppliers in order to benefit from lower factor costs. To illustrate this phenomenon we can observe in Figure 2 that trade in "Other Commercial Services", which consists mainly in business to business services or outsourcing services, has experienced a seven-fold increase in its export value over the last twenty years[2]. Besides the economic importance of services activity, in general, and service outsourcing, in particular, this phenomenon has received a huge amount of attention in the media and political circles[3] and the sector has increasingly been included under the framework of current multilateral negotiations (GATS) and regional agreements.

Notwithstanding the economic importance of services sector in national economies and in the globalization process, there is no economic consensus about how trade in services should be considered in trade liberalization analyses. Bhagwati et al.(2004) argue that outsourcing is fundamentally a trade phenomenon, hence, with respect to trade in goods, there is no need to use a different approach to analyse trade liberalization outcomes in the services sector . By contrast Mirza et al (2006) develop a theoretical model that incorporates a special feature in services trade, based on the fact that trade in some services can only occur if inputs from both trading countries are jointly used in the transaction process.

Some empirical research on the determinants of the bilateral trade in services has been already carried. Grünfeld and Moxnes (2003), Mirza et al. (2004), and Kimura and Lee (2003) explore for the determinants of bilateral trade in services using a gravity framework, differently to us they rely on aggregate data[4]. Additionally Freund and Weinhold (2002) also use a gravity framework but focus only on the U.S. case and mainly on the impact of the new communication technologies on traded services. Aviat and Coeurdacier (2005) apply also a gravitational framework to explain bilateral trade in financial assets. To control for endogeneity and to check for the direction of the causal relationship, they jointly study trade in goods and trade in banking assets in simultaneous gravity equations. The work of Kimura and Lee (2003) is the closest to our analysis, because, similarly to us, they also explore for differences[5] and complementarities between trade in services and trade in goods[6].

---

[2] Other interesting figures have been showed by Amiti and Wei (2004). Using input and output data for the United States and the UK they showed that service outsourcing is much lower than material outsourcing, but the first is increasing at a faster pace.

[3] For example: the reactions in France against "Bolkestein" directive (Directive on services in the internal market) at the time of European Referendum.

[4] Grünfeld and Moxnes (2003) also explore for factors explaining FDI in services.

[5] They use Chi² to test for differences in impact of variables when explaining trade in services vis-à-vis trade in goods. We use interaction terms instead.

[6] They used a residual approach in order to explore the complementarities, while we use Instrumental Variables (IV) technique.

The purpose of this paper is double. First, we empirically explore to what extent the determinants of trade in services differs from those of trade in goods and, second, by the use of instrumental variables, we explore for potential complementarities between bilateral trade in goods and bilateral trade in services. All over the analysis we use a gravity framework. We make use of two sets of explanatory variables. The first consists in a set of basic gravity variables, and then, the second adds to the analysis an array of variables we estimate to have an important role in explaining trade in services such as; the "bilateral trust and contract enforcement environment", the existence of "Networks", the regulation and qualification of the "labor markets" and the adoption of "technology and new communication technologies".

Given the lack of disaggregate data, previous analysis have only studied the determinant of trade in total services However it is reasonable to think that the nature of services such as the "Travel" and the "Other commercial services" sector should be highly different, and therefore their determinants might also differ. In this context the present analysis benefits from the new release of the OECD database on bilateral trade in services. The outstanding advantage of this new database is that trade in services has been classified by four sub-sectors: "Travel", "Transportation", "Other commercial services" and "Government services". Moreover focusing on "Other commercial services", the services sector presenting the highest trade growth rate over the last two decades, we enrich the set of explanatory variables. Finally, as far as we know, this work is the first attempt to explore for potential complementarities between trade in goods and trade in services using bilateral trade data as well as the Instrumental Variable (IV) technique.

The paper proceeds as follows. In Section 2, we present a review of special features of the services sector and some potential sources of complementarities between trade in services and trade in goods. In Section 3, we present the gravitational model and the data. In Section 4, we discuss results on the differences between trade in services and trade in goods. Section 5, we present results of the instrumental variable estimations and Section 6 concludes.

2. Characteristics of Services and Potential Complementarities

Service Characteristics

The services sector has been considered for a long time as the non-tradable sector of the economy, since a large number of services required physical contact between producers and consumers in order to allow the transaction to occur, rendering trading cost to remote locations prohibitive. New communication technologies in general and the Internet, in particular, help to overcome such historical barriers as they help to reduce transaction costs from unaffordable to virtually nothing (e.g. call centers and trade in financial assets) [7].

Services have a highly heterogeneous nature and they have often been considered as being intangible and non-storable[8]. The heterogeneous nature is drawn from several sources: (1)

[7] More details in the article of Freund and Weinhold (2002).

[8] With some exceptions such as: software programs or text translations registered in whatever support i.e. paper or electronically.

services often require the suppliers and the consumers to be physically located in the same place in order to fulfill the transaction, therefore they are differentiated by location[9]; (2) several services are customized in order to fit client needs, then, they are differenciated by client firms [10]; In addition, (3) they are highly specialized, in the sense that it is costly (in terms of time and money) to change the type of services offered, accordingly, services production might require expertise gained by education, training or experience[11] . Finally (4) they are heterogeneous in quality because they are labor-intensive[12].

As mentioned in the introduction "Other commercial services", which consists mainly in business to business services[13], has been the most dynamic sector of trade in services. This sub-sector has been characterized by Jones and Kierzkowski (2005), Markusen (1989) and Markusen et al. (2000 and 2005) as a sector presenting Increasing Returns to Scale. In particular, Markusen has modeled it as being: (1) a Knowledge-intensive sector requiring a high initial investment in learning (i.e. expertise), (2) a sector that is intensive in skilled labor and (3) which final products are highly differentiated.

Because of its intangible character and quality variability, services cannot always be identified by their clients before they are purchased or consumed, this phenomenon, in turn, generates information asymmetries and agency problems. Consequently, the experience of contracting a service can be risky.

Finally the fact that services are highly specialized and differentiated implies: (1) that services do not have reference prices and (2) that the efforts involved in searching the suited partner might be significant.

Complementarities

Some economists have suggested the existence of complementarities between bilateral trade in goods and bilateral trade in services. In Markusen's models, an increase in producer services varieties (varieties of intermediate services) confers a positive technological externality in final goods production, which in turn, makes total factor productivity to increase[14]. Amiti and Wei (2004) use data on US manufacturing industries and find that services outsourcing is positively correlated with labor productivity[15]. Francois and Wooton (2005) analyze the interaction between trade in goods and the level of competitiveness in the "export and retail related services" sector (i.e. shipping and logistic services, wholesale and final consumer distribution). They show theoretically and empirically that an uncompetitive

[9] As noted by Grünfeld and Moxnes (2003).

[10] For instance, SAP, one of the world's largest software providers for business, customizes their package software solutions in order to fit clients' needs , http://www.sap.com . "SAP understands that the only industry that matters to you is your industry. That's **why there's no such thing as a generic industry business solution from SAP**. Our industry solution sets are based on an in-depth **knowledge** of the processes that drive your business. So you can make better, more informed strategic decisions in the areas most important to you -- whether you want to gain greater visibility across your enterprise, get closer to your customers, or reduce inefficiencies. And since SAP has been **working with businesses like yours for 30 years**, we understand the demands of your industry". (Accessed in August, 282006. Emphases in bold are ours).

[11] As noted by Markusen (1989, 2000 and 2005).

[12] Performance quality of the tasks executed by workers is by nature variable because it depends on multiple factors, many of them beyond the firm control.

[13] For composition of OECD exports by type of services, see Figure 3.

[14] The key idea is that a diverse set (or higher quality set) of business services allows downstream users to purchase a quality-adjusted unit of business services at lower costs.

[15] Interestingly they do not find evidence for material inputs.

domestic services sector can act as an import barrier to trade in goods. In Feenstra et al. (2004) the authors focus on the importance of services intermediaries in reducing informational barriers to international trade in goods. They elaborate a theoretical model where countries benefit from purchasing goods from a remote country (China) by having access to intermediary services located in a third country (Hong Kong).

3. Empirical Evidence

The Gravity Equation

The empirical success of the gravity model for explaining and predicting bilateral trade patterns is well documented and has a rich history beginning with Jan Tinbergen (1962). The gravity equation is a log-linear specification, relating the nominal bilateral trade flow from exporting country *i* to importing country *j*, in which bilateral trade is proportional to country's masses (GDPs) and inversely related to their bilateral distance. Typically empirical analyses enrich the model including an array of variables and dummy variables reflecting for instance, presence of a Regional Trade Agreement, common language, or tariff.

The basic gravity equation takes the following econometric form:

$$Trade_{ij} = \beta_0 GDP_i^{\beta_1} GDP_j^{\beta_2} Dist_{ij}^{\beta_3} Z_{ij}^{\beta_4} e^{\beta_5 Dummy_{ij}} \varepsilon_{ij} \qquad (1)$$

Where "e" is the natural logarithm base and "ε" is a log-normally distributed error term.

Theoretical foundations for the model have already been provided and are now well established (See Baier and Bergstrand (2001) for more details). In particular, Helpman and Krugman (1985) develop a model of monopolistic competition that especially suits our purposes: This model is characterized by a large number of firms operating the market, each firm producing a unique variety of a differentiated product. New varieties can be produced only after incurring a fixed cost (therefore firms present internal Increasing Returns to Scale-IRS). Finally, the consumer function incorporates a "love of variety" approach (i.e. consumers benefit from diversity of varieties).

As discussed above, trade in services has some unique properties that make the gravity model appealing. First, service products are often differentiated by quality, by location and also by the fact that most of them are tailored in order to fulfill client firm needs. Second, and as mentioned by Jones and Kierzkowski (2005), Markusen (1989) and Markusen et al. (2000 and 2005), services must exhibit strong increasing returns to scale. Third, client firm improve their productivity from an increased number of varieties of services supply and hence show up a kind of "love of varieties" behavior. Finally, this type of model incorporates transaction costs, also present in services trade.

Taking the natural logarithm from (1) we will regress the following equation:

$$Ln(Trade_{ij}) = \beta_0 + \beta_1 Ln(GDP_i) + \beta_2 \ln(GDP_j) + \beta_3 \ln(Dist_{ij}) + \beta_z Z + \mu_{ij} \qquad (2)$$

Data

Data on bilateral trade in services are drawn from the OECD Statistics on International Trade in Services from 1999 to 2002. Our estimations concern 28 OECD countries and their partners. "Total services" data have been classified by four groups: "Travel", "Transportation", "Other commercial services" and "Government services". We gather data on bilateral trade in goods for the same period, for the same sample of countries as well as from the same source.

Basic Gravitational Variables

To account for the basic gravity variables we include in the regressions the countries's Gross Domestic Product (GDP) and their GDP per capita. As a proxy for transaction costs we use: the distance between capital cities[16]; a dummy which takes the value 1 is the pair of countries share a common border and 0 otherwise (contiguity); similarly, we include a dummy for common language between trading partners (if the common language is spoken by at least 9% of the population in both countries) as well as a dummy indicating if at least one of the two countries is landlocked. Additionally, for the case of common language, we use an alternative variable which takes into account the family language (e.g. French and English are Indo-European languages) and "sub-families" (e.g. French belongs to the Italic languages and English to the Germanic ones). Finally we include a dummy variable for common membership in regional/bilateral free trade agreement (RTA).[17]

Variables for Further Analysis

In order to capture the specificities of service trade we collect data on four thematic groups:

1. *Trust and contract enforcement,* as contracting a service could be a risky experience due to its variable nature.
2. *Networks,* because informational needs of searching a suited partner must be considerable in services case[18].
3. *Labor markets*; as services are labor-intensive (specifically in skilled labor).
4. *Technology and technology of communication,* as they have allowed original non-tradable services to become tradable.

For the *Trust and contract enforcement* group we gather data from Transparency International who generates a corruption index based on business people, academics and risk analysts'

[16] In the case of service trade, the distance can be also associated to higher transaction costs. In particular, distance can be reflecting the fact that some types of services require personal contact between providers and customers, then, for those services proximity is required, but distance can also be related to matching costs or searching costs of new commercial partners and when a successful matching occurs, distance can be related to higher coordination and enforcement contract costs.

[17] The dummy for regional trade agreements includes all agreements listed in Baier and Bergstrand (2004).

[18] As noted by Rauch (2001) Social and Business networks can facilitate matching of buyers and sellers through provision of market information, for instance, transnational community of Indian engineers has facilitated outsourcing of software development from Silicon Valley to regions like Bangalore and Hyderabad. Additionally *networks* can act as substitute for trust when contract enforcement is weak to nonexistent.

perceptions (*Corruption Perception Index-CPI*)[19]. Also we include an overall index of procedural complexity in commercial dispute resolution issued by the World Bank (*Procedural Complex Index*). Finally we incorporate a relative trust variable elaborated by Guiso et al. (2005)[20]. They obtain their measures of trust from a set of surveys conducted under the framework of the Eurobarometer project (sponsored by the European Commission) , In particular, the measure was constructed using the eurobarometer question: "*how much trust you have in people from various countries. For each, please tell me whether you have a lot of trust, some trust, not very much trust or no trust at all*"

To illustrate the *Network* group we include data on countries's migration drawn from the OECD database on immigrants and expatriates. In this database foreign born population has been classified according to the country of origin and to its level of education attainment [21] (*Low* for population with less than upper secondary education, *Medium* for people with upper secondary and post-secondary non-tertiary education and, *High*, consisting in tertiary and advanced research population). Additionally, we incorporate a dummy variable indicating 1 if the pair of countries has ever been in a colonial relationship (*colony*).

Regarding *labor market* characteristics, we incorporate the educational level of working labor (population over 25 years old). These data have been elaborated by Barro et al. (2000)[22]. Specifically we consider from this database four variables: the average schooling years of population; the percentage of "primary school attainment" (*prim_edu*); "secondary school attainment" (*second_edu*) and; "higher school attainment" (*high_edu*). Finally, we also include an index covering rigidities in country's labor market (*Empl_Laws_Index*) elaborated by the World Bank for the "Doing Business" project. This variable accounts for rigidities to hire and to fire as well as the minimum labor conditions imposed by law.

Finally, for the *technological environment* group, data are drawn from the World Bank Development Indicators (WDI). We consider variables indicating the number of: Personal computers (*Ln_PCs*), Internet users (*Ln_Internet_users)*, Telephone mainlines (*Ln_Tele_mainlines*) and Internet hosts (*Ln_internet_hosts*). All these variables are computed per 1,000 people. We additionally incorporate the level of Research and Development expenditure as the share of country GDP (*R&D*).

4. Econometric Results

This part is divided in three sections. In the initial two sections we analyze to what extent trade in services differs from trade in goods. In section 1, we regress trade in goods and trade in each type of services[23] on basic gravitational variables. In the second section we focus on the impact of the "Variables for further analysis" on trade in "Other Commercial Services" (henceforth OCS). In the third part we explore the potential complementarity between bilateral trade in goods and bilateral trade in OCS[24].

---

[19] http://www.transparency.org. The score ranges from 0 to 10, 10 meaning a corruption-free country.

[20] This variable represents the trust of people in importing country to people in exporting country (*Trust in i from j*)

[21] *Ln_mig_L, Ln_mig_M and Ln_mig_H* respectively.

[22] http://www.cid.harvard.edu/ciddata/ciddata.html .

[23] i.e. Total Services, Other Commercial Services, Travel, Transportation, and Government Services.

[24] We focus on trade in OCS since: (1) it has been the most dynamic sector in service trade (2) and also because theoretical models have focused on intermediate services (included in Other Commercial Services).

In order to test whether the explanatory variables differently affect trade in services and trade in goods, we use interaction terms, for each explanatory variable we multiply a dummy variable indicating 1 if the trade observation belongs to the services sample and 0 otherwise. That is, we allow explanatory variables to have differences in slope.

Then the estimated model with interaction terms is:

$$Ln(Trade_{ij}) = \beta_0 + \beta_h dum\ services_h + \sum_1^L \beta_l Z_l + \sum_1^L \beta_{l\_inter} Z_l * dum\ services_h + \mu_{ij}$$

Where:
h refers to the four services sub-sectors (Other Commercial Services, Travel, Transportation, Government services) as well as the aggregate data.
Z is the set of *L* explanatory variables
β_0= is the intercept for trade in goods

Since $\Delta Ln(Trade_{ij}) / \Delta Z_l = \beta_l + \beta_{l\_inter} * dum\ services_h$, we can interpret β_l as being the impact of the explanatory variable in trade in goods and β_{l_inter} as the incremental effect of the explanatory variable when explaining trade in services (i.e. $\beta_{l\_inter} + \beta_l$ = Net impact of the explanatory variable for the services sample)

Regressions on Basic Gravitational Variables

In Tables 1 to 5 we report the results on the basic gravitational variables. Each table presents a different services sector. Even though we will make reference of some particularities presented in travel and transport services, for the sake of brevity, we will focus on the results obtained from OCS sample which are presented in Table 1 (Tables 2 to 5 are in the appendix).

All estimated equations are based on Ordinary Least Square. In the upper part of the table we report the results of regressing trade in goods and trade in services (pooled) on the set of explanatory variables as well as on their interaction terms (denoted by the suffix term "*_inter"*) ; the bottom part of the table reports results when trade is regressed only for the services sample.

In Table 1, it is interesting to remark that, for all specifications, the effect of the variables related to physical geography (distance, contiguity and landlocked status)[25] is significantly lower when explaining trade in OCS. In contrast, the coefficient on the language variables, which can be considered as a cultural and/or informational proxy, is significantly higher in the case of services.

Regarding trade in transportation and travel services, it is not surprising that the findings obtained using the OCS sample do not necessarily apply to this two sectors. For instance, the impact of the landlocked status variable is more important in the case of transportation services than in the case of trade in goods, probably because countries without sea access simply could not offer maritime transport services[26]. Finally the variable contiguity does not seem to have a different effect on travel with respect to trade in goods.

[25] With the sole exception of the distance coefficient in column (5).
[26] By contrast, in the case of trade in goods when at least one of partner countries has a landlocked status the transportation costs of trading goods increase but not to the point to become prohibitive.

We respect to trade in OCS, the differential effect of the GDP per capita variable is positive and significant for both exporting and importing countries. For the case of the exporting country this is not astonishing since as indicated in the introduction, the contribution of services activity depends on the level of country development[27]. However, it is less straightforward for the importing country case. Two possible explanations can arise: (1) specialized OCS might require a more sophisticated target market able to consume complex services and (2) as suggested by Mirza et al (2006), trade in services can only occur if inputs from both trading countries are jointly used in the process[28]. This second argument also applies to the case of transport services where the coefficients on the GDP per capita variable are positive and significant; maybe because the GPD per capita is reflecting the level of transport infrastructure in both trading countries (Infrastructure required at bothe ends of the transaction to allow the transaction to occur). Differently, in the case of travel services sample, the coefficient on the exporting country's GDP per capita is negative[29].

Concerning the incremental effect of GDP on OCS, for the exporting country case[30], it is always positive and significant. In the case of the importing country, there is no clear pattern. Participation in a Regional Trade Agreement shows up to be more important for trade in OCS than for trade in goods (column 5) but its impact becomes insignificant when the GDP per capita variable is included (column 6). Finally the incremental impact of this variable performs differently in the travel services with respect to the transport services sample, it is positive and significant for the first and negative for the second.

[27] That is not the case for Industry and Agricultural sectors as we show in the Figure 1.

[28] Think about exports in complex software packages (e.g. Oracle and SAP) which are commercialised by a consulting firm in the importing country. Then, specialised computer skills are required in both the exporting and importing country in order to supply the software.

[29] A possible explanation for this result is the cost advantages of developing countries to offer low-cost destinations.

[30] This can be reflecting presence of IRS. Service firms from big domestic markets might benefit from scale economies at home, which, in turn, becomes a cost advantage at the moment to enter the international market.

Table 1 Regressions on basic gravitational variables

	(1)	(2)	(3)	(4)	(5)	(6)
	Ln (trade), Total Goods & Other commercial services, Exports,OLS, dummy year					
Ln_dist_cap	-0.840***	-0.782***	-0.750***	-0.806***	-0.797***	-0.793***
	[0.015]	*[0.018]*	*[0.017]*	*[0.018]*	*[0.019]*	*[0.019]*
Ln_dist_cap_inter	0.130***	0.079***	0.087***	0.102***	0.045	0.054*
	[0.027]	*[0.031]*	*[0.028]*	*[0.031]*	*[0.032]*	*[0.031]*
1 for contiguity		0.752***	0.860***	0.764***	0.679***	0.691***
		[0.069]	*[0.057]*	*[0.070]*	*[0.059]*	*[0.061]*
contig_inter		-0.283**	-0.268***	-0.294**	-0.365***	-0.338***
		[0.125]	*[0.103]*	*[0.126]*	*[0.109]*	*[0.106]*
1 if a language is spoken by at least 9% of the	0.598***			0.588***	0.560***	0.548***
	[0.061]			*[0.060]*	*[0.059]*	*[0.059]*
comlang_ethno_inter	0.581***			0.590***	0.646***	0.620***
	[0.092]			*[0.091]*	*[0.089]*	*[0.085]*
Index of similarity for language - Tree			-0.206**			
			[0.098]			
tree_lang_ind_inter			1.333***			
			[0.159]			
At_least_one_landlock				-0.277***	-0.269***	-0.251***
				[0.042]	*[0.042]*	*[0.042]*
At_least_one_landlock_inter				0.253***	0.141*	0.190***
				[0.075]	*[0.074]*	*[0.073]*
Regional Trade Agreement					0.094**	0.028
					[0.038]	*[0.040]*
RTA_inter					0.152**	-0.003
					[0.070]	*[0.072]*
Ln_GDPi	0.917***	0.895***	0.893***	0.856***	0.837***	0.811***
	[0.012]	*[0.012]*	*[0.012]*	*[0.013]*	*[0.014]*	*[0.015]*
Ln_GDPi_inter	0.091***	0.076***	0.180***	0.112***	0.186***	0.119***
	[0.021]	*[0.020]*	*[0.019]*	*[0.022]*	*[0.021]*	*[0.025]*
Ln_GDPj	0.780***	0.770***	0.768***	0.766***	0.763***	0.746***
	[0.012]	*[0.012]*	*[0.012]*	*[0.012]*	*[0.012]*	*[0.012]*
Ln_GDPj_inter	-0.054**	-0.047**	0.006	-0.043**	0.022	-0.017
	[0.022]	*[0.020]*	*[0.019]*	*[0.020]*	*[0.019]*	*[0.020]*
Ln_GDP_CAPi						0.128***
						[0.040]
Ln_GDP_CAPi_inter						0.314***
						[0.068]
Ln_GDP_CAPj						0.062***
						[0.016]
Ln_GDP_CAPj_inter						0.141***
						[0.025]
Observations	5832	5832	5606	5832	5606	5606
Adjusted R-squared	0.95	0.96	0.96	0.96	0.96	0.96

	(1)	(2)	(3)	(4)	(5)	(6)
	Ln (trade), Other commercial services, Exports,OLS, dummy year					
Ln_dist_cap	-0.710***	-0.702***	-0.664***	-0.704***	-0.753***	-0.740***
	[0.022]	*[0.025]*	*[0.022]*	*[0.026]*	*[0.025]*	*[0.024]*
1 for contiguity		0.470***	0.590***	0.471***	0.314***	0.352***
		[0.104]	*[0.086]*	*[0.104]*	*[0.091]*	*[0.087]*
1 if a language is spoken by at least 9% of the	1.180***			1.179***	1.202***	1.164***
	[0.069]			*[0.069]*	*[0.067]*	*[0.061]*
Index of similarity for language - Tree			1.122***			
			[0.125]			
At_least_one_landlock				-0.023	-0.127**	-0.061
				[0.062]	*[0.061]*	*[0.060]*
Regional Trade Agreement					0.245***	0.024
					[0.059]	*[0.060]*
Ln_GDPi	1.007***	0.971***	1.072***	0.968***	1.023***	0.929***
	[0.017]	*[0.016]*	*[0.015]*	*[0.018]*	*[0.017]*	*[0.020]*
Ln_GDPj	0.725***	0.722***	0.774***	0.722***	0.785***	0.729***
	[0.018]	*[0.017]*	*[0.015]*	*[0.017]*	*[0.015]*	*[0.016]*
Ln_GDP_CAPi						0.442***
						[0.055]
Ln_GDP_CAPj						0.203***
						[0.019]
Observations	2916	2916	2803	2916	2803	2803
Adjusted R-squared	0.69	0.72	0.74	0.72	0.76	0.78

Robust standard errors in brackets

** significant at 10%; ** significant at 5%; *** significant at 1%*

constant estimated but not reported

Testing Particular Aspects of Trade in Other Commercial Services

Tables 5 to 9 report results of regressions for trade in OCS on: Trust and contract enforcement (Table 6), Networks (Table 7), Labor market (Table 8) and Technology and technology of communication (Table 9). As in the previous section each table presents results of both the pooled sample (trade in goods and trade in services) and the services (OCS) sample.

Results in Table 6 show us that variables explaining trust and contract enforcement environments are consistently more important in the case of OCS. This is consistent with the hypothesis that services contract is a risky experience and that the existence of secure environments might have a higher impact on the business services sector than on the manufacturing sector.

Table 7 reports results on the effect of Networks. As expected, the existence of a colonial relationship has a higher impact on trade in services than on trade in goods.

Additionally, as the literature suggests, Networks can promote trade through two main economic mechanisms: First, Networks can reduce information costs as immigrants know the characteristics of many domestic buyers and sellers and carry this knowledge abroad (Rauch 2001) and second, Networks can act as a diffusion agent of preferences. Presence of foreigners can raise imports from origin countries both because migrants bring their tastes for home goods and because nationals partly could acquire a taste for those new varieties (Combes et al. 2005). Presumably, informational channel takes place mainly through the impact of immigrants on exports since they may influence creation of new business between their host country and their country of origin. By contrast, the preference effect mainly takes place by the impact of immigrants on imports, as immigrants stimulate consumption of goods from their home countries. We expect that in the case of more differentiated products (i.e. OCS) the networks as information mechanism should prevail, while in the case of product having "reference prices" (i.e. Goods) the preference mechanism should be more important. Therefore, immigrants must have a bigger impact on exports in the case of OCS than in the case of goods (and a relative lower impact when analyzing imports). Our findings seem to follow this pattern. For all migration variables, the impact of migration on trade in OCS is more important for exporting regressions (column 2-5, bottom, Table 7) than for the case of imports (column 6-9) regressions.The contrary happens for the trade in goods case.

It is interesting to remark that the positive effect of migration on trade increases with the level of education of migrants for both trade in goods and trade in OCS, but it is in the last case where the impact increases the most. Doubling the number of highly qualified migrants increases the exports of services by 14.7 percent, and by 9.3 percent for the case of exported goods. When considering migrants with low level of education the effects are 4.3 percent and 6.7 percent respectively[31].

In the same line and for the export case, the differential effect is positive and significant for highly educated migrants. As the level of education decreases, the differential effect also decreases; even it becomes negative, yet non significant, for migrants with low levels of

[31] However, results might be considered with caution because of the potential existence of reverse causality. Migrants could be more attracted to host countries with large services sectors (hence, potentially strong exporters of services), to the extent that the bigger the services sector is, the higher the work opportunities in services sector are.

education. For the case of the imports regressions the differential effect is always negative and significant, but their negative effect decreases with the level of education.

Results in Table 8 suggest that educational attainment and freedom in labor markets have a higher impact on trade in OCS than on trade in goods.

The average schooling years in both exporting and importing country has a significantly higher impact on OCS than on trade in goods. Attaining an additional schooling year in the exporting country leads to an increase in exports of OCS by 17.4 percent and to an increase in exported goods by 7.4 percent[32].

Regarding the variables by level of education, the pattern found in the case of the migrant variables also applies here. For the population with the highest level of education the differential effect is positive and significant. As the level of education decreases, the differential effect also decreases, and becomes significantly negative for the bottom level of education[33].

We found that rigidities in country's labor market, in both exporter and importer countries, have a higher impact on trade in OCS than on trade in goods.

Finally, as shown in Table 9, the incremental effect for all our "technological environment" variables are always positive and statistically significant, this result supports the argument that technological advances are more influential on services trade, probably as they have allowed original non-tradable services to become tradable.

[32] Here again, the coefficients must be considered with caution because of potential problems of endogeneity. Maybe, the existence of a dynamic service sector can also act as a private incentive to invest in education.

[33] See for instance the case of the population with the highest level of education for the trade in goods (column 2). The coefficient for the exporting country is negative (and for the importing country is non significant). By contrast they are positive and highly significant for both countries in the case of services trade (column 7).

Table 6 Trust and contract enforcement

	(1)	(2)	(3)
	Ln (trade), Total Goods and Other commercial services, Exports,OLS, dummy year		
Trust in i from j	0.237*		
	[0.141]		
Trust_in_i_from_j_inter	0.545**		
	[0.264]		
i_Corruption Perceptions Index		0.042***	
		[0.010]	
CPI_score_i_inter		0.165***	
		[0.016]	
j_Corruption Perceptions Index		0.047***	
		[0.007]	
CPI_score_j_inter		0.068***	
		[0.011]	
Procedural_Complex_Index_i			-0.003**
			[0.001]
procedural_complex_index_i_inter			-0.017***
			[0.002]
Procedural_Complex_Index_j			-0.005***
			[0.001]
procedural_complex_index_j_inter			-0.006***
			[0.002]
Ln_dist_cap	-0.834***	-0.795***	-0.784***
	[0.036]	*[0.017]*	*[0.017]*
Ln_dist_cap_inter	-0.240***	-0.006	-0.055**
	[0.064]	*[0.027]*	*[0.028]*
1 if a language is spoken by	0.206**	0.516***	0.504***
	[0.102]	*[0.057]*	*[0.059]*
comlang_ethno_inter	0.545***	0.350***	0.304***
	[0.179]	*[0.081]*	*[0.087]*
1 for contiguity	0.459***	0.686***	0.683***
	[0.059]	*[0.063]*	*[0.062]*
contig_inter	-0.521***	-0.274**	-0.287***
	[0.141]	*[0.109]*	*[0.109]*
Ln_GDPi	0.817***	0.902***	0.893***
	[0.017]	*[0.012]*	*[0.013]*
Ln_GDPi_inter	0.198***	0.071***	0.214***
	[0.036]	*[0.019]*	*[0.019]*
Ln_GDPj	0.872***	0.757***	0.775***
	[0.020]	*[0.011]*	*[0.012]*
Ln_GDPj_inter	-0.119***	0.044**	0.080***
	[0.041]	*[0.018]*	*[0.018]*
Dummy=Other commercial	-8.558***	-12.454***	-11.575***
	[0.715]	*[0.330]*	*[0.378]*
Constant	-1.078***	-1.780***	-0.916***
	[0.357]	*[0.204]*	*[0.238]*
Observations	1300	5436	5122
Adjusted R-squared	0.97	0.97	0.97

Robust standard errors in brackets

** significant at 10%; ** significant at 5%; *** significant at 1%*

	(4)	(5)	(6)
	Ln (trade), Other commercial services, Exports,OLS, dummy year		
Trust in i from j	0.778***		
	[0.222]		
i_Corruption Perceptions Index		0.207***	
		[0.013]	
j_Corruption Perceptions Index		0.115***	
		[0.009]	
Procedural_Complex_Index_i			-0.019***
			[0.002]
Procedural_Complex_Index_j			-0.011***
			[0.001]
Ln_dist_cap	-1.072***	-0.800***	-0.840***
	[0.053]	*[0.021]*	*[0.022]*
1 if a language is spoke	0.729***	0.868***	0.808***
	[0.150]	*[0.057]*	*[0.064]*
1 for contiguity	-0.056	0.413***	0.395***
	[0.127]	*[0.088]*	*[0.089]*
Ln_GDPi	1.019***	0.974***	1.106***
	[0.031]	*[0.015]*	*[0.014]*
Ln_GDPj	0.752***	0.801***	0.854***
	[0.035]	*[0.015]*	*[0.014]*
Constant	-9.710***	-14.236***	-12.448***
	[0.625]	*[0.271]*	*[0.300]*
Observations	650	2718	2561
Adjusted R-squared	0.78	0.79	0.79

Robust standard errors in brackets

** significant at 10%; ** significant at 5%; *** significant at 1%*

Table 7 Networks

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Ln (trade), Total Goods and Other commercial services, Exports,OLS, dummy year					**Ln (trade), Total Goods and Other commercial services,** Imports, OLS, dummy year			
1 for pairs ever in colonial	0.180**								
	[0.073]								
colony_inter	0.415***								
	[0.121]								
Ln_mig_H		0.093***				0.121***			
		[0.013]				*[0.015]*			
Ln_mig_H_inter		0.052**				-0.055**			
		[0.021]				*[0.023]*			
Ln_mig_M			0.091***				0.109***		
			[0.011]				*[0.013]*		
Ln_mig_M_inter			0.006				-0.062***		
			[0.019]				*[0.020]*		
Ln_mig_L				0.067***				0.099***	
				[0.010]				*[0.011]*	
Ln_mig_L_inter				-0.025				-0.098***	
				[0.016]				*[0.017]*	
Ln_migration					0.094***				0.107***
					[0.012]				*[0.013]*
Ln_migration_inter					-0.01				-0.083***
					[0.019]				*[0.021]*
Ln_dist_cap	-0.791***	-0.789***	-0.774***	-0.775***	-0.779***	-0.648***	-0.646***	-0.642***	-0.642***
	[0.017]	*[0.019]*	*[0.019]*	*[0.019]*	*[0.019]*	*[0.022]*	*[0.023]*	*[0.023]*	*[0.022]*
Ln_dist_cap_inter	0.033	0.032	0.024	0.007	0.034	-0.167***	-0.158***	-0.174***	-0.156***
	[0.029]	*[0.032]*	*[0.032]*	*[0.033]*	*[0.032]*	*[0.034]*	*[0.035]*	*[0.035]*	*[0.035]*
1 if a language is spoken by	0.535***	0.488***	0.507***	0.573***	0.506***	0.379***	0.432***	0.482***	0.428***
	[0.064]	*[0.065]*	*[0.063]*	*[0.062]*	*[0.063]*	*[0.072]*	*[0.069]*	*[0.066]*	*[0.068]*
comlang_ethno_inter	0.504***	0.534***	0.649***	0.686***	0.665***	0.724***	0.730***	0.757***	0.763***
	[0.095]	*[0.099]*	*[0.098]*	*[0.094]*	*[0.098]*	*[0.115]*	*[0.112]*	*[0.108]*	*[0.112]*
1 for contiguity	0.659***	0.633***	0.589***	0.615***	0.589***	0.726***	0.662***	0.655***	0.684***
	[0.061]	*[0.076]*	*[0.075]*	*[0.075]*	*[0.075]*	*[0.077]*	*[0.079]*	*[0.078]*	*[0.078]*
contig_inter	-0.412***	-0.395***	-0.362***	-0.306**	-0.316**	-0.382***	-0.324**	-0.227*	-0.286**
	[0.113]	*[0.137]*	*[0.136]*	*[0.136]*	*[0.135]*	*[0.134]*	*[0.135]*	*[0.134]*	*[0.133]*
Ln_GDPi	0.900***	0.785***	0.791***	0.804***	0.784***	0.791***	0.816***	0.811***	0.807***
	[0.012]	*[0.018]*	*[0.016]*	*[0.016]*	*[0.017]*	*[0.021]*	*[0.019]*	*[0.018]*	*[0.019]*
Ln_GDPi_inter	0.089***	0.044	0.084***	0.122***	0.093***	-0.025	-0.038	0.006	-0.016
	[0.019]	*[0.030]*	*[0.027]*	*[0.027]*	*[0.028]*	*[0.033]*	*[0.029]*	*[0.029]*	*[0.031]*
Ln_GDPj	0.777***	0.739***	0.740***	0.748***	0.737***	0.823***	0.835***	0.833***	0.822***
	[0.011]	*[0.014]*	*[0.013]*	*[0.013]*	*[0.013]*	*[0.015]*	*[0.014]*	*[0.014]*	*[0.014]*
Ln_GDPj_inter	0.011	-0.049**	-0.033	-0.01	-0.040*	-0.048*	-0.065***	-0.044*	-0.060**
	[0.018]	*[0.022]*	*[0.022]*	*[0.022]*	*[0.022]*	*[0.025]*	*[0.025]*	*[0.025]*	*[0.025]*
Observations	5760	5038	5050	5016	5072	5222	5240	5206	5264
Adjusted R-squared	0.96	0.96	0.96	0.96	0.96	0.95	0.95	0.95	0.95

	(10)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
	Ln (trade), Other commercial services, Exports,OLS, dummy year					**Ln (trade), Other commercial services,** Imports,OLS, dummy year			
1 for pairs ever in colonial	0.595***								
	[0.096]								
Ln_mig_H		0.147***				0.068***			
		[0.017]				*[0.018]*			
Ln_mig_M			0.099***				0.048***		
			[0.015]				*[0.015]*		
Ln_mig_L				0.043***				0.001	
				[0.012]				*[0.013]*	
Ln_migration					0.085***				0.024
					[0.015]				*[0.016]*
Ln_dist_cap	-0.757***	-0.756***	-0.749***	-0.768***	-0.744***	-0.813***	-0.804***	-0.815***	-0.797***
	[0.023]	*[0.025]*	*[0.026]*	*[0.026]*	*[0.026]*	*[0.026]*	*[0.026]*	*[0.027]*	*[0.026]*
1 if a language is spoken by	1.040***	1.020***	1.156***	1.259***	1.170***	1.103***	1.163***	1.240***	1.192***
	[0.070]	*[0.075]*	*[0.075]*	*[0.071]*	*[0.075]*	*[0.090]*	*[0.088]*	*[0.085]*	*[0.088]*
1 for contiguity	0.249***	0.238**	0.227**	0.308***	0.273**	0.344***	0.338***	0.427***	0.397***
	[0.095]	*[0.114]*	*[0.114]*	*[0.113]*	*[0.113]*	*[0.110]*	*[0.109]*	*[0.109]*	*[0.108]*
Ln_GDPi	0.989***	0.828***	0.874***	0.925***	0.876***	0.766***	0.778***	0.817***	0.790***
	[0.016]	*[0.024]*	*[0.022]*	*[0.021]*	*[0.022]*	*[0.025]*	*[0.023]*	*[0.022]*	*[0.024]*
Ln_GDPj	0.787***	0.689***	0.706***	0.737***	0.696***	0.774***	0.770***	0.789***	0.761***
	[0.015]	*[0.017]*	*[0.017]*	*[0.018]*	*[0.017]*	*[0.020]*	*[0.020]*	*[0.021]*	*[0.020]*
Observations	2880	2519	2525	2508	2536	2611	2620	2603	2632
Adjusted R-squared	0.74	0.75	0.74	0.74	0.74	0.71	0.71	0.7	0.7

Robust standard errors in brackets

** significant at 10%; ** significant at 5%; *** significant at 1%*

Table 8 Labor markets

	(1)	(2)	(3)	(4)	(5)
	Ln (trade), Total Goods and Other commercial services, Exports,OLS, dummy year				
years_edu_i	0.071***				
	[0.011]				
years_edu_i_inter	0.089***				
	[0.017]				
years_edu_j	0.039***				
	[0.008]				
years_edu_j_inter	0.055***				
	[0.013]				
high_edu_i		-0.004**			
		[0.002]			
high_edu_i_inter		0.013***			
		[0.003]			
high_edu_j		0.001			
		[0.002]			
high_edu_j_inter		0.010***			
		[0.003]			
second_edu_i			0.019***		
			[0.002]		
second_edu_i_inter			0.004		
			[0.003]		
second_edu_j			0.008***		
			[0.001]		
second_edu_j_inter			0.009***		
			[0.002]		
prim_edu_i				-0.012***	
				[0.002]	
prim_edu_i_inter				-0.007***	
				[0.002]	
prim_edu_j				-0.002	
				[0.001]	
prim_edu_j_inter				-0.013***	
				[0.002]	
Empl_Laws_Index_i					-0.002*
					[0.001]
empl_laws_index_i_inter					-0.013***
					[0.002]
Empl_Laws_Index_j					-0.009***
					[0.001]
empl_laws_index_j_inter					-0.009***
					[0.002]
Ln_dist_cap	-0.791***	-0.775***	-0.746***	-0.805***	-0.784***
	[0.018]	*[0.019]*	*[0.019]*	*[0.018]*	*[0.016]*
Ln_dist_cap_inter	-0.059*	-0.095***	-0.024	-0.066**	-0.025
	[0.031]	*[0.033]*	*[0.031]*	*[0.031]*	*[0.027]*
1 if a language is spok	0.506***	0.655***	0.691***	0.547***	0.445***
	[0.063]	*[0.068]*	*[0.060]*	*[0.064]*	*[0.058]*
comlang_ethno_inter	0.407***	0.353***	0.550***	0.424***	0.303***
	[0.094]	*[0.101]*	*[0.090]*	*[0.096]*	*[0.083]*
1 for contiguity	0.414***	0.428***	0.352***	0.389***	0.678***
	[0.060]	*[0.064]*	*[0.064]*	*[0.060]*	*[0.063]*
contig_inter	-0.447***	-0.423***	-0.463***	-0.465***	-0.299***
	[0.117]	*[0.123]*	*[0.119]*	*[0.116]*	*[0.111]*
Ln_GDPi	0.884***	0.901***	0.873***	0.858***	0.885***
	[0.014]	*[0.015]*	*[0.014]*	*[0.014]*	*[0.013]*
Ln_GDPi_inter	0.154***	0.146***	0.166***	0.151***	0.154***
	[0.022]	*[0.023]*	*[0.022]*	*[0.023]*	*[0.019]*
Ln_GDPj	0.719***	0.730***	0.720***	0.732***	0.766***
	[0.014]	*[0.015]*	*[0.013]*	*[0.014]*	*[0.012]*
Ln_GDPj_inter	0	-0.002	0.007	-0.008	0.078***
	[0.022]	*[0.023]*	*[0.022]*	*[0.022]*	*[0.018]*
Dummy=Other comme	-12.188***	-10.944***	-11.971***	-10.040***	-11.250***
	[0.460]	*[0.471]*	*[0.468]*	*[0.521]*	*[0.415]*
Constant	-1.362***	-0.829***	-1.702***	0.365	-0.556**
	[0.296]	*[0.296]*	*[0.301]*	*[0.330]*	*[0.269]*
Observations	4128	4128	4128	4128	5122
Adjusted R-squared	0.97	0.96	0.97	0.97	0.97

Robust standard errors in brackets

** significant at 10%; ** significant at 5%; *** significant at 1%*

	(6)	(7)	(8)	(9)	(10)
	Ln (trade), Other commercial services, Exports,OLS, dummy year				
years_edu_i	0.160***				
	[0.013]				
years_edu_j	0.093***				
	[0.010]				
high_edu_i		0.009***			
		[0.002]			
high_edu_j		0.011***			
		[0.002]			
second_edu_i			0.023***		
			[0.002]		
second_edu_j			0.017***		
			[0.002]		
prim_edu_i				-0.019***	
				[0.002]	
prim_edu_j				-0.014***	
				[0.002]	
Empl_Laws_Index_i					-0.016***
					[0.002]
Empl_Laws_Index_j					-0.018***
					[0.001]
Ln_dist_cap	-0.850***	-0.870***	-0.770***	-0.871***	-0.810***
	[0.024]	*[0.027]*	*[0.025]*	*[0.025]*	*[0.021]*
1 if a language is s	0.912***	1.007***	1.240***	0.970***	0.745***
	[0.070]	*[0.075]*	*[0.067]*	*[0.072]*	*[0.060]*
1 for contiguity	-0.033	0.005	-0.111	-0.075	0.378***
	[0.100]	*[0.105]*	*[0.100]*	*[0.099]*	*[0.091]*
Ln_GDPi	1.038***	1.047***	1.038***	1.008***	1.039***
	[0.017]	*[0.018]*	*[0.017]*	*[0.017]*	*[0.015]*
Ln_GDPj	0.718***	0.728***	0.727***	0.724***	0.844***
	[0.017]	*[0.018]*	*[0.017]*	*[0.017]*	*[0.014]*
Constant	-13.495***	-11.728***	-13.615***	-9.625***	-11.720***
	[0.361]	*[0.372]*	*[0.366]*	*[0.407]*	*[0.324]*
Observations	2064	2064	2064	2064	2561
Adjusted R-squared	0.78	0.76	0.78	0.77	0.79

Robust standard errors in brackets

** significant at 10%; ** significant at 5%; *** significant at 1%*

Table 9 Technology and technology of communication

	(1)	(2)	(3)	(4)	(5)
	Ln (trade), Total Goods and Other commercial services, Exports,OLS, dummy year				
Ln_PCs_i	0.297***				
	[0.035]				
Ln_PCs_i_inter	0.549***				
	[0.056]				
Ln_PCs_j	0.104***				
	[0.014]				
Ln_PCs_j_inter	0.129***				
	[0.021]				
Ln_Internet_users_i		0.309***			
		[0.039]			
Ln_Internet_users_i_inter		0.272***			
		[0.061]			
Ln_Internet_users_j		0.129***			
		[0.014]			
Ln_Internet_users_j_inter		0.087***			
		[0.023]			
Ln_Tele_mainlines_i			-0.224***		
			[0.085]		
Ln_Tele_mainlines_i_inter			1.943***		
			[0.147]		
Ln_Tele_mainlines_j			0.098***		
			[0.024]		
Ln_Tele_mainlines_j_inter			0.192***		
			[0.038]		
Ln_internet_hosts_1_i				0.170***	
				[0.028]	
Ln_internet_hosts_1_i_inter				0.121***	
				[0.045]	
Ln_internet_hosts_1_j				0.062***	
				[0.011]	
Ln_internet_hosts_1_j_inter				0.041**	
				[0.018]	
R&D_i (% of GDP)					0.202***
					[0.024]
R_D_i_inter					0.076*
					[0.044]
R&D_j (% of GDP)					-0.01
					[0.017]
R_D_j_inter					0.070**
					[0.031]
Ln_dist_cap	-0.788***	-0.785***	-0.753***	-0.772***	-0.841***
	[0.017]	*[0.018]*	*[0.019]*	*[0.027]*	*[0.021]*
Ln_dist_cap_inter	0.014	0.059*	0.082***	0.063	0.013
	[0.026]	*[0.030]*	*[0.031]*	*[0.045]*	*[0.034]*
1 if a language is spoken by	0.494***	0.524***	0.599***	0.494***	0.547***
	[0.058]	*[0.061]*	*[0.060]*	*[0.084]*	*[0.067]*
comlang_ethno_inter	0.467***	0.591***	0.580***	0.481***	0.609***
	[0.084]	*[0.090]*	*[0.088]*	*[0.124]*	*[0.105]*
1 for contiguity	0.687***	0.736***	0.756***	0.751***	0.636***
	[0.063]	*[0.071]*	*[0.070]*	*[0.109]*	*[0.066]*
contig_inter	-0.351***	-0.309***	-0.219*	-0.266	-0.347***
	[0.104]	*[0.119]*	*[0.121]*	*[0.183]*	*[0.118]*
Ln_GDPi	0.860***	0.857***	0.916***	0.856***	0.829***
	[0.013]	*[0.012]*	*[0.013]*	*[0.018]*	*[0.014]*
Ln_GDPi_inter	0.025	0.057***	-0.060***	0.135***	0.156***
	[0.020]	*[0.021]*	*[0.022]*	*[0.028]*	*[0.024]*
Ln_GDPj	0.743***	0.741***	0.755***	0.747***	0.769***
	[0.011]	*[0.012]*	*[0.012]*	*[0.018]*	*[0.012]*
Ln_GDPj_inter	-0.001	-0.039*	-0.059***	-0.048	0.068***
	[0.018]	*[0.021]*	*[0.021]*	*[0.031]*	*[0.021]*
Dummy=Other commercia	-13.598***	-12.105***	-21.906***	-11.936***	-12.758***
	[0.372]	*[0.417]*	*[0.877]*	*[0.518]*	*[0.363]*
Constant	-2.565***	-2.614***	-0.78	-1.758***	-0.366*
	[0.234]	*[0.258]*	*[0.511]*	*[0.316]*	*[0.212]*
Observations	5678	5466	5802	2586	3690
Adjusted R-squared	0.97	0.96	0.96	0.96	0.97

Robust standard errors in brackets

** significant at 10%; ** significant at 5%; *** significant at 1%*

	(6)	(7)	(8)	(9)	(10)
	Ln (trade), Other commercial services, Exports,OLS, dummy year				
Ln_PCs_i	0.855***				
	[0.044]				
Ln_PCs_j	0.237***				
	[0.016]				
Ln_Internet_users_i		0.610***			
		[0.052]			
Ln_Internet_users_j		0.224***			
		[0.018]			
Ln_Tele_mainlines_i			1.716***		
			[0.120]		
Ln_Tele_mainlines_j			0.290***		
			[0.030]		
Ln_internet_hosts_1_i				0.304***	
				[0.037]	
Ln_internet_hosts_1_j				0.104***	
				[0.014]	
R&D_i (% of GDP)					0.281***
					[0.037]
R&D_j (% of GDP)					0.062**
					[0.026]
Ln_dist_cap	-0.775***	-0.727***	-0.671***	-0.709***	-0.829***
	[0.021]	*[0.025]*	*[0.025]*	*[0.036]*	*[0.027]*
1 if a language is	0.955***	1.107***	1.179***	0.965***	1.155***
	[0.061]	*[0.067]*	*[0.065]*	*[0.091]*	*[0.081]*
1 for contiguity	0.336***	0.430***	0.538***	0.485***	0.288***
	[0.082]	*[0.095]*	*[0.099]*	*[0.146]*	*[0.098]*
Ln_GDPi	0.881***	0.909***	0.855***	0.986***	0.983***
	[0.015]	*[0.017]*	*[0.017]*	*[0.022]*	*[0.020]*
Ln_GDPj	0.739***	0.699***	0.696***	0.696***	0.835***
	[0.015]	*[0.017]*	*[0.017]*	*[0.025]*	*[0.017]*
Constant	-16.074***	-14.699***	-22.620***	-13.621***	-13.022***
	[0.293]	*[0.333]*	*[0.714]*	*[0.413]*	*[0.310]*
Observations	2839	2733	2901	1293	1845
Adjusted R-squared	0.79	0.75	0.75	0.77	0.79

Robust standard errors in brackets

** significant at 10%; ** significant at 5%; *** significant at 1%*

5. Instrumental Variables Estimation

As instruments for trade in "Other commercial services" we use data on regulatory conditions in professional services sectors, elaborated by the OECD[34]. In particular, we use an indicator which summarizes the rigidities that professionals face in order to exercise their occupations.

To instrument trade in goods[35] we use (1) the *average applied import tariff* of non-agricultural and non-fuel products[36] and (2) a variable indicating if at least one of the two countries has a landlocked status[37].

The First-Stage regressions perform reasonably well, suggesting that we do not have a "weak" instruments problem. Additionally, the Sargan tests confirm the validity of our instruments: our instruments for trade in goods are affecting trade in services only through their impact on trade in goods (and vice versa our instruments for trade in services are not affecting independently trade in goods) [38].

Table 10 presents results on the implementation of instrumental variables[39]. The first three columns present the regressions for the trade in goods sample: a simple OLS regression is estimated for comparison in column (1). In column (2) we add trade in OCS as explanatory variable using OLS and column (3) presents results when trade in services is instrumented. Columns 4 to 6 repeat the same exercise, this time, for regressions explaining trade in "Other commercial services".

The coefficients of our instrumental variables are positive and significant at standard levels. Trade in goods affects strongly trade in services: the estimated elasticity is almost 1, indicating that an increase in "x" percent of trade in goods induces the same percent increase in bilateral trade in services. Reciprocally, trade in OCS affects positively bilateral trade in goods although the effect is less strong (0.46).

Regarding the other coefficients it is interesting to remark that: first, once we add trade in services to explain trade in goods, the coefficient on the language variable drastically decreases and even becomes negative (columns (2) and (3)). Second, when we add trade in goods in order to explain trade in OCS, the coefficients on geographical variables (contiguity and distance) decrease even to the limit to reverse their signs (columns (5) and (6)). These results seem to indicate that the effect of cultural and /or informational variables affect positively trade in goods indirectly through their impact on trade in services. Conversely, the effect of the geographical variables affect (in the traditional way) trade in services indirectly through their impact on trade in goods.

[34] Conway, P. and G. Nicoletti (2006), "Product market regulation in non-manufacturing sectors: measurement and highlights", OECD Economics Department Working Paper

[35] We also use, without success because of endogeneity, (1) the bilateral cost of shipping a ton between the two main cities of the country pair using UPS services, (2) data on average time in clearing exports and (3) data on average time in claiming imports from Enterprise Surveys from World Bank.

[36] Data are drawn from UNCTAD Handbook of Statistics On-line.

[37] We use population instead GDP to avoid potential problems of collinearity.

[38] The Partial-R^2 is 0.13 for instruments in the case of trade in services; and 0.3 in the case of traded goods. Chi^2 from Sargan tests are 0.73 and 0.22 respectively.

[39] In the Appendix we show the first-stage regressions.

Table 10 Instrumental Variables Estimation

	(1)	(2)	(3)	(4)	(5)	(6)
	Total Goods, Ln (trade), Exports, OLS , dummy year	**Total Goods, Ln (trade), Exports, OLS , dummy year**	**Total Goods, Ln (trade), Exports, IV , dummy year**	**Other services , Ln (trade), Exports, OLS, dummy year**	**Other services , Ln (trade), Exports, OLS, dummy year**	**Other services , Ln (trade), Exports, IV, dummy year**
Ln_dist_cap	-0.826***	-0.410***	-0.344***	-0.695***	0.077**	0.086**
	[0.028]	[0.030]	[0.060]	[0.040]	[0.030]	[0.038]
1 if a language	0.226**	-0.254***	-0.331***	1.256***	0.640***	0.633***
	[0.097]	[0.082]	[0.102]	[0.123]	[0.082]	[0.084]
1 for contiguity	0.671***	0.675***	0.675***	0.634***	-0.266**	-0.277**
	[0.099]	[0.080]	[0.080]	[0.167]	[0.111]	[0.114]
Ln_pop_i	0.781***	0.400***	0.340***	0.963***	0.047*	0.036
	[0.025]	[0.027]	[0.055]	[0.030]	[0.027]	[0.038]
Ln_pop_j	0.669***	0.443***	0.406***	0.506***	-0.051**	-0.058**
	[0.022]	[0.021]	[0.036]	[0.026]	[0.020]	[0.026]
Ln (Trade in Other Services)		0.395***	0.458***			
		[0.019]	[0.053]			
Ln (Trade in Goods)					0.978***	0.990***
					[0.019]	[0.034]
Constant	6.391***	7.194***	7.322***	-4.902***	-9.592***	-9.649***
	[0.357]	[0.291]	[0.308]	[0.435]	[0.301]	[0.330]
Observations	797	797	797	2101	2101	2101
Adjusted R-squ	0.77	0.85		0.46	0.77	

Standard errors in brackets
** significant at 10%; ** significant at 5%; *** significant at 1%*

6. Conclusion

Using disaggregate data on trade in services, we have empirically explored, first to what extent trade in services differs from trade in goods and second the existence of a complementarity relationship between bilateral trade in goods and bilateral trade in services.

We found that the effects of variables related to physical geography (distance, contiguity and landlocked status) are significantly lower when explaining trade in Other Commercial Services. By contrast, language variables, which can be considered as cultural and/or informational proxies, impact more significantly trade in service than trade in goods. Additionally results are consistent with the hypotheses that *Trust and contract enforcement, Networks, Countries' level of education, Labor markets regulation* and *Technology of communication* are more important when explaining trade in Other Commercial Services than when explaining trade in goods.

Finally using instrumental variables the results indicate that trade in goods and in Other Commercial Services reinforce each other. Bilateral trade in goods explains bilateral trade in services: the resulting estimated elasticity is close to 1. Reciprocally, bilateral trade in services affects positively bilateral trade in goods: a 10% increase in trade in services raises traded goods by 4.6%.

References

1 Amiti M.; S. Wei (October 2004); *Fear of Service Outsourcing: Is It Justified?*
IMF Working Papers

2 Aviat A. and N. Coeurdacier (2005); *The Geography of Trade in Goods and Asset Holdings*
Forthcoming in the Journal of International Economics.

3 Baier S. and Bergstrand J. (2001). *The Growth of World Trade: Tariffs, Transport Costs, and Income Similarity* , Journal of International Economics, Vol. 53, pp: 1–27

4 Barro, R.. and J. Lee, (2000); *International Data on Educational Attainment: Updates and Implications*
CID Working Paper No. 42

5 Bhagwati J.; A. Panagariya and T. Srinivasan (August 2004); *The Muddles over Outsourcing*
The Journal of Economic Perspectives; Vol. 18, Nº 4, pp 93–114

6 Combes P.; M.Lafourcade and T. Maye (2005); *The trade-creating effects of business and social networks: evidence from France*
Journal of International Economics; Vol. 66, Issue 1, pp. 1-29

7 Conway, P. and G. Nicoletti (2006), *Product market regulation in non-manufacturing sectors: measurement and highlights* , OECD Economics Department Working Paper

8 Deardoff A.; D.Brown and R.Stern (1995); *Modelling Multilateral Trade Liberalization in Services*
Working Papers from Michigan - Research Forum on International Economics

9 Deardorff A.; V. and R.Stern (January 2004); *Empirical Analysis of Barriers to International Services Transactions and the Consequences of Liberalization*
University of Michigan; Discussion Paper No. 505

10 Feenstra R.; G. Hanson, and S. Lin (2004) T*he Value of Information in International Trade: Gains to Outsourcing through Hong Kong*
Advances in Economic Analysis & Policy; Vol. 4: No. 1, Article 7.

11 Francois J. and I. Wooton (July 2005); *Market Structure in Services and Market Access in Goods*
CEPR; Discussion paper N° 5135

12 Freund C., and D. Weinhold (2002); *The Internet and International Trade in Services*
American Economic Review; Vol. 92, No.2, pp. 236–40

13 Grünfeld L. and A. Moxnes (2003); *The Intangible Globalization: Explaining the Patterns of International Trade in Services*
Norwegian Institute of International Affairs; Working Paper Nº 657

14 Guiso L.; P. Sapienza and L. Zingales (2005); *Cultural Biases in Economic Exchange*
CEPR; Discussion paper Nº 4837

15 Helpman, E. and P. Krugman (1985). *Market Structure and Foreign Trade: Increasing Returns, Imperfect Competition and the International Economy* , Cambridge, MA: MIT Press.

16 Jones R. and H. Kierzkowski (March 2005) *International fragmentation and the new economic geography*
The North American Journal of Economics and Finance; Volume 16, Issue 1, pp 1-10

17 Jones R., H. Kierzkowski and C. Lurong (2005); *What does evidence tell us about fragmentation and outsourcing?* International Review of Economics & Finance; Vol. 14, issue 3, pp 305-316

18 Kimura F. and H. Lee (2006)*; The Gravity Equation in International Trade in Services* Review of World Economics; Vol. 142, issue 1, pp 92-121

19 Markusen , J.(1989) *Trade in producer services and in other specialized Intermediate Inputs* American Economic Review; Vol. 79, N° 1, 85-85

20 Markusen, J.; T. Rutherford and D.Tarr (August 2000); *Foreign Direct Investment in Services and the Domestic Market for Expertise* World Bank, Policy Research Working Paper; Nº 2413

21 Markusen, J.; T. Rutherford and D.Tarr (August 2005); *Trade and direct investment in producer services and the domestic market for expertise* Canadian Journal of Economics; Vol. 38, N° 3, pp. 758-777(20)

22 Martin P., T. Mayer and M. Thoenig (September 2005); *Make trade not war?* CEPR; Discussion paper N° 5218

23 Mirza. D; G. Nicoletti and C. Lennon (2006); *Complementarity of Inputs Across Countries in Services Trade* mimeo

24 Rauch James E.(2001); *Business and social networks in international trade* Journal of Economic Literature; Vol. 39, Nº 4, pp. 1177– 1203

25 Tinbergen, J. (1962). *Shaping the World Economy – Suggestions for an International Economic Policy* , The Twentieth Century Fund.

26 Van Marrewijk C.;J. Stibora and A. de Vaal (November 1996); *Services tradability, trade liberalization and Foreign Direct Investment* Economica; Vol. 63, Nº 252, pp 611-631

Figure 1

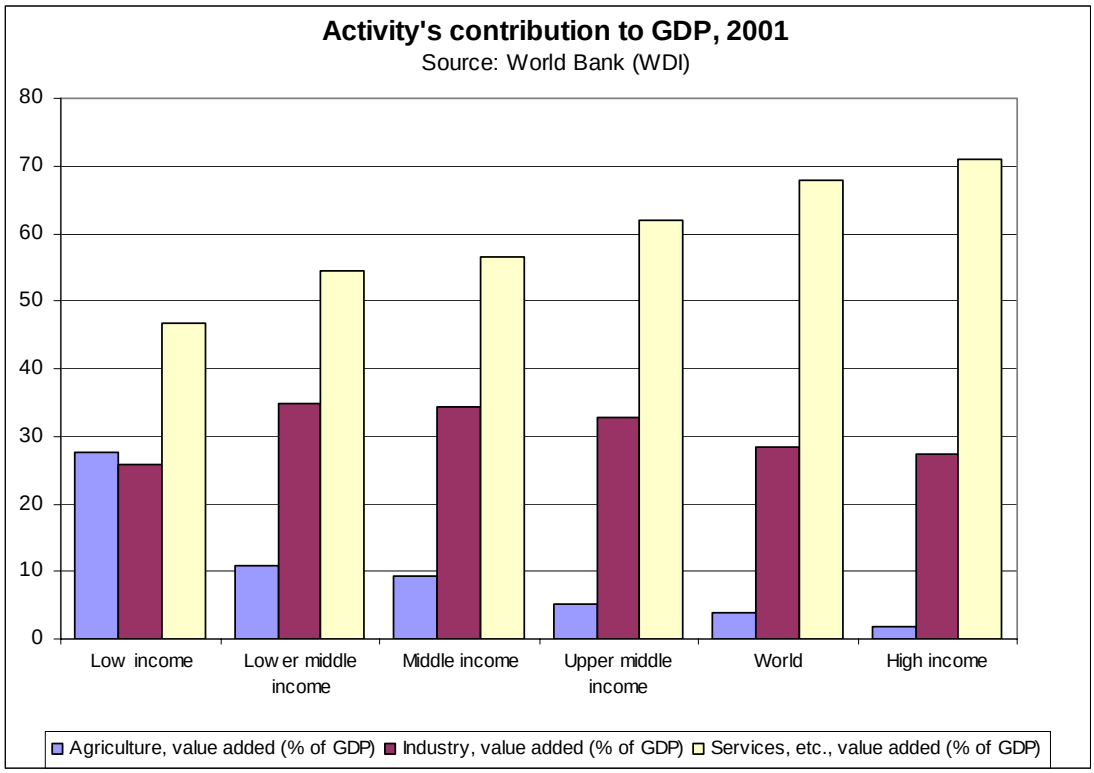

Figure 2

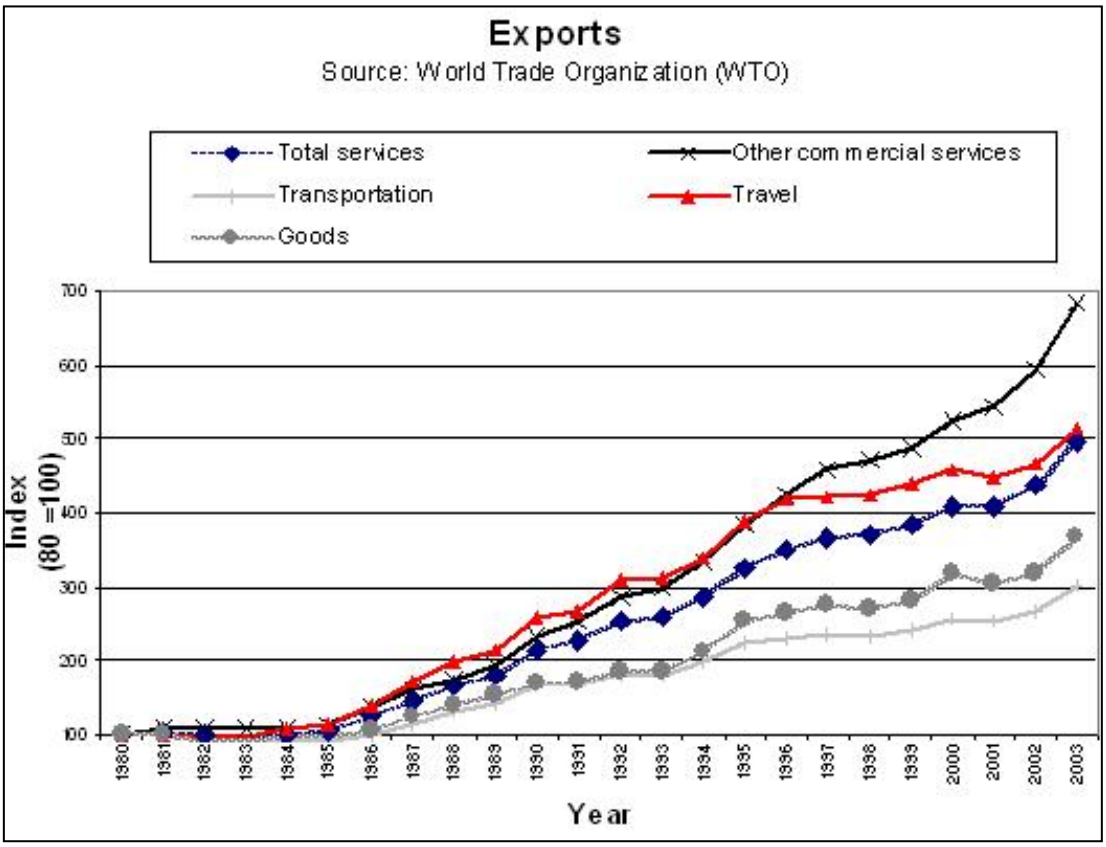

Figure 3

2002 OECD Total Service Exports
(Millions of US dollars)

		Share in OECD Total Trade
TOTAL SERVICES	1,250,067	22%

		Share in Total Services
Other Commercial Services	600,564	48%
Travel	345,082	28%
Transportation	267,520	21%
Government	36,901	3%

		Share in Other Commercial Services
268: Other business services	278,629	46%
266: Royalties and license fees	81,570	14%
260: Financial services	80,579	13%
262: Computer and information services	43,631	7%
253: Insurance services	41,402	7%
245: Communication services	27,473	5%
249: Construction services	24,672	4%
287: Personal, cultural and recreational services	22,609	4%

Source: OECD Statistics on International Trade in Services

Table 2

	Ln (trade), Total Goods &Total Services, Exports,OLS, dummy year					
Ln_dist_cap	-0.860***	-0.801***	-0.758***	-0.822***	-0.786***	-0.776***
	[0.016]	*[0.018]*	*[0.016]*	*[0.018]*	*[0.019]*	*[0.018]*
Ln_dist_cap_inter	0.175***	0.149***	0.133***	0.170***	0.092***	0.108***
	[0.026]	*[0.029]*	*[0.026]*	*[0.030]*	*[0.030]*	*[0.028]*
1 for contiguity		0.757***	0.961***	0.774***	0.727***	0.754***
		[0.075]	*[0.065]*	*[0.074]*	*[0.066]*	*[0.071]*
contig_inter		-0.135	-0.241**	-0.151	-0.311***	-0.281**
		[0.126]	*[0.108]*	*[0.125]*	*[0.118]*	*[0.117]*
1 if a language is spoken by at least 9% of the		0.749***		0.736***	0.707***	0.699***
		[0.067]		*[0.066]*	*[0.065]*	*[0.064]*
comlang_ethno_inter		0.643***		0.656***	0.726***	0.711***
		[0.092]		*[0.091]*	*[0.090]*	*[0.086]*
Index of similarity for language - Tree			-0.309***			
			[0.100]			
tree_lang_ind_inter			1.675***			
			[0.150]			
At_least_one_landlock				-0.232***	-0.188***	-0.099**
				[0.043]	*[0.042]*	*[0.044]*
At_least_one_landlock_inter				0.229***	0.097	0.151**
				[0.071]	*[0.070]*	*[0.068]*
Regional Trade Agreement					0.133***	0.007
					[0.038]	*[0.041]*
RTA_inter					0.278***	0.119*
					[0.063]	*[0.065]*
Ln_GDPi	0.952***	0.927***	0.914***	0.890***	0.856***	0.786***
	[0.013]	*[0.013]*	*[0.012]*	*[0.014]*	*[0.014]*	*[0.015]*
Ln_GDPi_inter	0.004	-0.013	0.088***	0.024	0.099***	0.046*
	[0.021]	*[0.021]*	*[0.020]*	*[0.023]*	*[0.022]*	*[0.024]*
Ln_GDPj	0.817***	0.802***	0.789***	0.800***	0.779***	0.747***
	[0.012]	*[0.012]*	*[0.011]*	*[0.012]*	*[0.011]*	*[0.012]*
Ln_GDPj_inter	-0.053***	-0.053***	0.034*	-0.051***	0.038**	-0.008
	[0.020]	*[0.019]*	*[0.018]*	*[0.019]*	*[0.017]*	*[0.018]*
Ln_GDP_CAPi						0.325***
						[0.038]
Ln_GDP_CAPi_inter						0.248***
						[0.061]
Ln_GDP_CAPj						0.126***
						[0.015]
Ln_GDP_CAPj_inter						0.166***
						[0.023]
Observations	7164	7164	6844	7164	6844	6844
Adjusted R-squared	0.94	0.95	0.95	0.95	0.95	0.96

	(1)	(2)	(3)	(4)	(5)	(6)
	Ln (trade), Total Services, Exports,OLS, dummy year					
Ln_dist_cap	-0.684***	-0.651***	-0.625***	-0.652***	-0.694***	-0.668***
	[0.020]	*[0.023]*	*[0.020]*	*[0.023]*	*[0.023]*	*[0.022]*
1 for contiguity		0.623***	0.719***	0.623***	0.415***	0.473***
		[0.101]	*[0.086]*	*[0.101]*	*[0.098]*	*[0.093]*
1 if a language is spoken by at least 9% of the	1.396***			1.396***	1.431***	1.408***
	[0.063]			*[0.063]*	*[0.063]*	*[0.058]*
Index of similarity for language - Tree			1.364***			
			[0.113]			
At_least_one_landlock				-0.004	-0.09	0.053
				[0.057]	*[0.056]*	*[0.052]*
Regional Trade Agreement					0.411***	0.127**
					[0.050]	*[0.050]*
Ln_GDPi	0.958***	0.916***	1.001***	0.915***	0.955***	0.831***
	[0.017]	*[0.017]*	*[0.016]*	*[0.018]*	*[0.017]*	*[0.018]*
Ln_GDPj	0.764***	0.749***	0.823***	0.748***	0.817***	0.739***
	[0.016]	*[0.015]*	*[0.013]*	*[0.015]*	*[0.013]*	*[0.014]*
Ln_GDP_CAPi						0.574***
						[0.048]
Ln_GDP_CAPj						0.293***
						[0.018]
Observations	3582	3582	3422	3582	3422	3422
Adjusted R-squared	0.68	0.72	0.73	0.72	0.75	0.78

Robust standard errors in brackets

** significant at 10%; ** significant at 5%; *** significant at 1%*

constant estimated but not reported

Table 3

	Ln (trade), Total Goods & Transportation, Exports,OLS, dummy year					
Ln_dist_cap	-0.796***	-0.723***	-0.701***	-0.745***	-0.727***	-0.719***
	[0.015]	*[0.017]*	*[0.017]*	*[0.018]*	*[0.019]*	*[0.019]*
Ln_dist_cap_inter	0.248***	0.207***	0.225***	0.179***	0.115***	0.125***
	[0.027]	*[0.031]*	*[0.030]*	*[0.031]*	*[0.034]*	*[0.033]*
1 for contiguity		0.846***	0.986***	0.857***	0.793***	0.825***
		[0.070]	*[0.064]*	*[0.070]*	*[0.063]*	*[0.067]*
contig_inter		-0.278**	-0.296***	-0.264**	-0.348***	-0.311***
		[0.120]	*[0.110]*	*[0.118]*	*[0.113]*	*[0.113]*
1 if a language is spoken by at least 9% of the	0.604***			0.599***	0.575***	0.557***
	[0.066]			*[0.066]*	*[0.065]*	*[0.064]*
comlang_ethno_inter		0.475***		0.468***	0.518***	0.497***
		[0.096]		*[0.095]*	*[0.094]*	*[0.092]*
Index of similarity for language - Tree			-0.316***			
			[0.101]			
tree_lang_ind_inter			1.152***			
			[0.164]			
At_least_one_landlock				-0.231***	-0.224***	-0.172***
				[0.041]	*[0.042]*	*[0.043]*
At_least_one_landlock_inter				-0.287***	-0.332***	-0.267***
				[0.074]	*[0.076]*	*[0.076]*
Regional Trade Agreement					0.131***	0.031
					[0.038]	*[0.040]*
RTA_inter					-0.028	-0.146**
					[0.070]	*[0.071]*
Ln_GDPi	0.888***	0.859***	0.873***	0.830***	0.817***	0.778***
	[0.012]	*[0.012]*	*[0.012]*	*[0.013]*	*[0.014]*	*[0.015]*
Ln_GDPi_inter	-0.038*	-0.052***	-0.018	-0.088***	-0.054**	-0.101***
	[0.020]	*[0.020]*	*[0.020]*	*[0.022]*	*[0.022]*	*[0.026]*
Ln_GDPj	0.774***	0.759***	0.757***	0.757***	0.748***	0.723***
	[0.012]	*[0.011]*	*[0.011]*	*[0.011]*	*[0.011]*	*[0.012]*
Ln_GDPj_inter	-0.052***	-0.047**	-0.011	-0.049***	0.006	-0.023
	[0.020]	*[0.019]*	*[0.019]*	*[0.019]*	*[0.019]*	*[0.020]*
Ln_GDP_CAPi						0.225***
						[0.040]
Ln_GDP_CAPi_inter						0.269***
						[0.073]
Ln_GDP_CAPj						0.103***
						[0.015]
Ln_GDP_CAPj_inter						0.119***
						[0.026]
Observations	6348	6348	6162	6348	6162	6162
Adjusted R-squared	0.95	0.96	0.96	0.96	0.96	0.96
	(1)	(2)	(3)	(4)	(5)	(6)
	Ln (trade), Transportation, Exports,OLS, dummy year					
Ln_dist_cap	-0.548***	-0.515***	-0.477***	-0.566***	-0.613***	-0.594***
	[0.023]	*[0.026]*	*[0.025]*	*[0.026]*	*[0.029]*	*[0.027]*
1 for contiguity		0.568***	0.690***	0.593***	0.444***	0.514***
		[0.097]	*[0.089]*	*[0.095]*	*[0.093]*	*[0.090]*
1 if a language is spoken by at least 9% of the	1.079***			1.068***	1.092***	1.053***
	[0.070]			*[0.068]*	*[0.068]*	*[0.066]*
Index of similarity for language - Tree			0.835***			
			[0.129]			
At_least_one_landlock				-0.518***	-0.556***	-0.438***
				[0.062]	*[0.063]*	*[0.063]*
Regional Trade Agreement					0.103*	-0.114*
					[0.058]	*[0.059]*
Ln_GDPi	0.849***	0.806***	0.854***	0.742***	0.763***	0.677***
	[0.017]	*[0.016]*	*[0.017]*	*[0.018]*	*[0.018]*	*[0.021]*
Ln_GDPj	0.722***	0.711***	0.746***	0.708***	0.754***	0.701***
	[0.016]	*[0.015]*	*[0.015]*	*[0.015]*	*[0.015]*	*[0.016]*
Ln_GDP_CAPi						0.496***
						[0.062]
Ln_GDP_CAPj						0.222***
						[0.021]
Observations	3174	3174	3081	3174	3081	3081
Adjusted R-squared	0.6	0.64	0.62	0.64	0.65	0.68

Robust standard errors in brackets

** significant at 10%; ** significant at 5%; *** significant at 1%*

constant estimated but not reported

Table 4

	(1)	(2)	(3)	(4)	(5)	(6)
	Ln (trade), Total Goods & Travel, Exports,OLS, dummy year					
Ln_dist_cap	-0.880***	-0.833***	-0.776***	-0.852***	-0.815***	-0.819***
	[0.017]	*[0.018]*	*[0.019]*	*[0.019]*	*[0.021]*	*[0.020]*
Ln_dist_cap_inter	0.132***	0.120***	0.215***	0.121***	0.163***	0.221***
	[0.029]	*[0.031]*	*[0.031]*	*[0.032]*	*[0.037]*	*[0.035]*
1 for contiguity		0.627***	0.883***	0.628***	0.634***	0.680***
		[0.070]	*[0.070]*	*[0.069]*	*[0.070]*	*[0.072]*
contig_inter		0.163	0.219*	0.163	0.118	0.08
		[0.121]	*[0.116]*	*[0.120]*	*[0.122]*	*[0.124]*
1 if a language is spoken by at least 9% of th		0.738***		0.731***	0.732***	0.708***
		[0.069]		*[0.068]*	*[0.068]*	*[0.066]*
comlang_ethno_inter		0.893***		0.894***	0.933***	0.925***
		[0.094]		*[0.093]*	*[0.094]*	*[0.093]*
Index of similarity for language - Tree			-0.152			
			[0.108]			
tree_lang_ind_inter			1.895***			
			[0.169]			
At_least_one_landlock				-0.199***	-0.166***	-0.164***
				[0.045]	*[0.046]*	*[0.044]*
At_least_one_landlock_inter				0.016	0.07	-0.06
				[0.080]	*[0.082]*	*[0.076]*
Regional Trade Agreement					0.162***	0.048
					[0.039]	*[0.042]*
RTA_inter					0.378***	0.369***
					[0.074]	*[0.075]*
Ln_GDPi	0.950***	0.910***	0.923***	0.887***	0.869***	0.787***
	[0.013]	*[0.013]*	*[0.014]*	*[0.015]*	*[0.016]*	*[0.017]*
Ln_GDPi_inter	-0.123***	-0.165***	-0.124***	-0.163***	-0.155***	0.098***
	[0.023]	*[0.022]*	*[0.024]*	*[0.025]*	*[0.026]*	*[0.028]*
Ln_GDPj	0.804***	0.791***	0.774***	0.789***	0.770***	0.753***
	[0.013]	*[0.012]*	*[0.013]*	*[0.013]*	*[0.013]*	*[0.014]*
Ln_GDPj_inter	-0.019	-0.02	-0.019	-0.02	-0.015	-0.094***
	[0.021]	*[0.019]*	*[0.021]*	*[0.019]*	*[0.020]*	*[0.021]*
Ln_GDP_CAPi						0.342***
						[0.032]
Ln_GDP_CAPi_inter						-0.975***
						[0.051]
Ln_GDP_CAPj						0.075***
						[0.018]
Ln_GDP_CAPj_inter						0.216***
						[0.029]
Observations	5494	5494	5364	5494	5364	5364
Adjusted R-squared	0.95	0.96	0.95	0.96	0.96	0.96

	(1)	(2)	(3)	(4)	(5)	(6)
	Ln (trade), Travel, Exports,OLS, dummy year					
Ln_dist_cap	-0.748***	-0.713***	-0.560***	-0.730***	-0.652***	-0.597***
	[0.024]	*[0.026]*	*[0.025]*	*[0.026]*	*[0.030]*	*[0.028]*
1 for contiguity		0.791***	1.103***	0.793***	0.753***	0.761***
		[0.099]	*[0.093]*	*[0.098]*	*[0.100]*	*[0.102]*
1 if a language is spoken by at least 9% of th	1.633***			1.626***	1.666***	1.634***
	[0.064]			*[0.064]*	*[0.065]*	*[0.066]*
Index of similarity for language - Tree			1.743***			
			[0.130]			
At_least_one_landlock				-0.184***	-0.096	-0.222***
				[0.067]	*[0.068]*	*[0.061]*
Regional Trade Agreement					0.540***	0.416***
					[0.062]	*[0.062]*
Ln_GDPi	0.828***	0.746***	0.799***	0.725***	0.714***	0.887***
	[0.019]	*[0.018]*	*[0.019]*	*[0.020]*	*[0.021]*	*[0.022]*
Ln_GDPj	0.785***	0.771***	0.755***	0.769***	0.755***	0.658***
	[0.016]	*[0.015]*	*[0.016]*	*[0.015]*	*[0.015]*	*[0.016]*
Ln_GDP_CAPi						-0.636***
						[0.041]
Ln_GDP_CAPj						0.291***
						[0.023]
Observations	2747	2747	2682	2747	2682	2682
Adjusted R-squared	0.6	0.67	0.63	0.67	0.67	0.72

Robust standard errors in brackets
** significant at 10%; ** significant at 5%; *** significant at 1%*
constant estimated but not reported

Table 5

	(1)	(2)	(3)	(4)	(5)	(6)
	Ln (trade), Total Goods & Government, Exports,OLS, dummy year					
Ln_dist_cap	-0.831***	-0.771***	-0.730***	-0.794***	-0.773***	-0.760***
	[0.019]	*[0.021]*	*[0.022]*	*[0.020]*	*[0.024]*	*[0.024]*
Ln_dist_cap_inter	0.633***	0.515***	0.552***	0.541***	0.481***	0.455***
	[0.031]	*[0.035]*	*[0.037]*	*[0.035]*	*[0.038]*	*[0.038]*
1 for contiguity		0.485***	0.730***	0.527***	0.530***	0.526***
		[0.069]	*[0.062]*	*[0.066]*	*[0.068]*	*[0.070]*
contig_inter		-0.836***	-0.843***	-0.883***	-0.909***	-0.910***
		[0.125]	*[0.116]*	*[0.124]*	*[0.125]*	*[0.125]*
1 if a language is spoken by at least 9% of the	0.753***			0.755***	0.755***	0.746***
	[0.076]			*[0.071]*	*[0.071]*	*[0.070]*
comlang_ethno_inter		0.165		0.162	0.167	0.196
		[0.144]		*[0.142]*	*[0.142]*	*[0.141]*
Index of similarity for language - Tree			-0.027			
			[0.121]			
tree_lang_ind_inter			0.679***			
			[0.210]			
At_least_one_landlock				-0.466***	-0.434***	-0.449***
				[0.048]	*[0.049]*	*[0.051]*
At_least_one_landlock_inter				0.514***	0.442***	0.501***
				[0.080]	*[0.081]*	*[0.082]*
Regional Trade Agreement					0.107**	0.054
					[0.042]	*[0.045]*
RTA_inter					-0.304***	-0.238***
					[0.082]	*[0.087]*
Ln_GDPi	0.884***	0.855***	0.874***	0.791***	0.791***	0.782***
	[0.017]	*[0.017]*	*[0.017]*	*[0.018]*	*[0.019]*	*[0.018]*
Ln_GDPi_inter	-0.389***	-0.382***	-0.389***	-0.312***	-0.306***	-0.335***
	[0.029]	*[0.029]*	*[0.029]*	*[0.033]*	*[0.033]*	*[0.035]*
Ln_GDPj	0.747***	0.740***	0.731***	0.728***	0.720***	0.693***
	[0.017]	*[0.015]*	*[0.018]*	*[0.015]*	*[0.015]*	*[0.017]*
Ln_GDPj_inter	-0.247***	-0.230***	-0.237***	-0.216***	-0.190***	-0.141***
	[0.030]	*[0.027]*	*[0.030]*	*[0.027]*	*[0.029]*	*[0.030]*
Ln_GDP_CAPi						0.053
						[0.059]
Ln_GDP_CAPi_inter						0.149*
						[0.087]
Ln_GDP_CAPj						0.073***
						[0.019]
Ln_GDP_CAPj_inter						-0.114***
						[0.032]
Observations	3040	3040	3014	3040	3014	3014
Adjusted R-squared	0.98	0.98	0.98	0.98	0.98	0.98

	(1)	(2)	(3)	(4)	(5)	(6)
	Ln (trade), Government, Exports,OLS, dummy year					
Ln_dist_cap	-0.197***	-0.255***	-0.178***	-0.252***	-0.291***	-0.304***
	[0.024]	*[0.028]*	*[0.029]*	*[0.028]*	*[0.030]*	*[0.029]*
1 for contiguity		-0.349***	-0.111	-0.354***	-0.377***	-0.382***
		[0.104]	*[0.098]*	*[0.104]*	*[0.105]*	*[0.104]*
1 if a language is spoken by at least 9% of the	0.916***			0.916***	0.921***	0.941***
	[0.122]			*[0.123]*	*[0.123]*	*[0.123]*
Index of similarity for language - Tree			0.651***			
			[0.172]			
At_least_one_landlock				0.051	0.01	0.052
				[0.064]	*[0.065]*	*[0.064]*
Regional Trade Agreement					-0.199***	-0.184**
					[0.071]	*[0.074]*
Ln_GDPi	0.494***	0.472***	0.484***	0.479***	0.484***	0.449***
	[0.024]	*[0.024]*	*[0.024]*	*[0.027]*	*[0.027]*	*[0.030]*
Ln_GDPj	0.500***	0.509***	0.493***	0.510***	0.530***	0.552***
	[0.024]	*[0.023]*	*[0.025]*	*[0.023]*	*[0.025]*	*[0.024]*
Ln_GDP_CAPi						0.192***
						[0.065]
Ln_GDP_CAPj						-0.042
						[0.025]
Observations	1520	1520	1507	1520	1507	1507
Adjusted R-squared	0.42	0.46	0.43	0.46	0.46	0.46

Robust standard errors in brackets

** significant at 10%; ** significant at 5%; *** significant at 1%*

constant estimated but not reported

Table 11 first-stage regression

	(1)	(2)
	Ln (trade), Exports, OLS	
	Other Commercial services	**Total Goods**
Prof_reg_i	-0.287***	
	[0.034]	
Prof_reg_j	-0.298***	
	[0.041]	
Tariff		-0.117***
		[0.004]
At_least_one_landlock		-0.753***
		[0.063]
Ln_dist_cap	-1.013***	-0.822***
	[0.039]	[0.026]
1 if a language is spoken by at l	1.248***	0.681***
	[0.137]	[0.079]
1 for contiguity	0.171	0.806***
	[0.140]	[0.107]
Ln_pop_i	1.027***	0.873***
	[0.036]	[0.021]
Ln_pop_j	0.667***	0.673***
	[0.034]	[0.017]
Constant	-2.516***	5.408***
	[0.504]	[0.322]
Observations	797	2101
Partial R-squared	0.13	0.3
chi-squared	0.73	0.22
Adjusted R-squared	0.7	0.72
Standard errors in brackets		
** significant at 10%; ** significant at 5%; *** significant at 1%*		
dummy year included		